

Airline Passenger Satisfaction

By: Michael Holthouser

Overview

- **Business Understanding**
 - Stakeholder
 - Business Question
- **Data Understanding**
- **Modeling**
 - Best Model
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 - Recommendations
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Business Understanding

- **Stakeholder:**

- Explorer Airlines

- **Business Problem:**

- Explorer Airlines has tasked me to provide prediction analysis on their passenger's satisfaction levels.

- **Business Question:**

- What key features do passengers find most important while traveling?



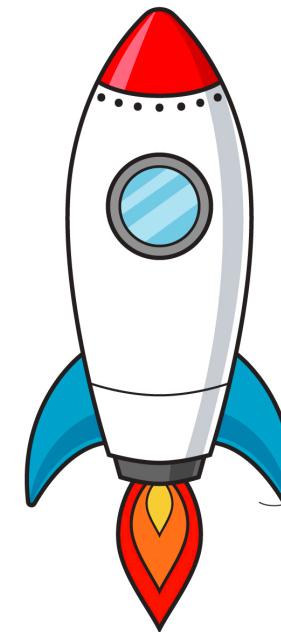
Data Understanding

- **Gender:** male or female
- **Customer type:** regular or non-regular airline customer
- **Type of travel:** the purpose of the passenger's flight (personal or business travel)
- **Class:** business, economy, economy plus
- **Flight distance:** The flight distance of this journey
- **Inflight wifi service:** satisfaction level with Wi-Fi service on board (1-5)
- **Ease of Online booking:** online booking satisfaction rate (1-5)
- **Food and drink:** food and drink satisfaction level (1-5)
- **Online boarding:** satisfaction level with online boarding (1-5)
- **Seat comfort:** seat satisfaction level (1-5)
- **Inflight entertainment:** satisfaction with inflight entertainment (1-5)
- **On-board service:** level of satisfaction with on-board service (1-5)
- **Leg room service:** level of satisfaction with leg room service (1-5)
- **Baggage handling:** level of satisfaction with baggage handling (1-5)
- **Checkin service:** level of satisfaction with checkin service (1-5)
- **Inflight service:** level of satisfaction with inflight service (1-5)
- **Cleanliness:** level of satisfaction with cleanliness (1-5)
- **Satisfaction:** Airline satisfaction level(Satisfaction, neutral or dissatisfaction).



Modeling

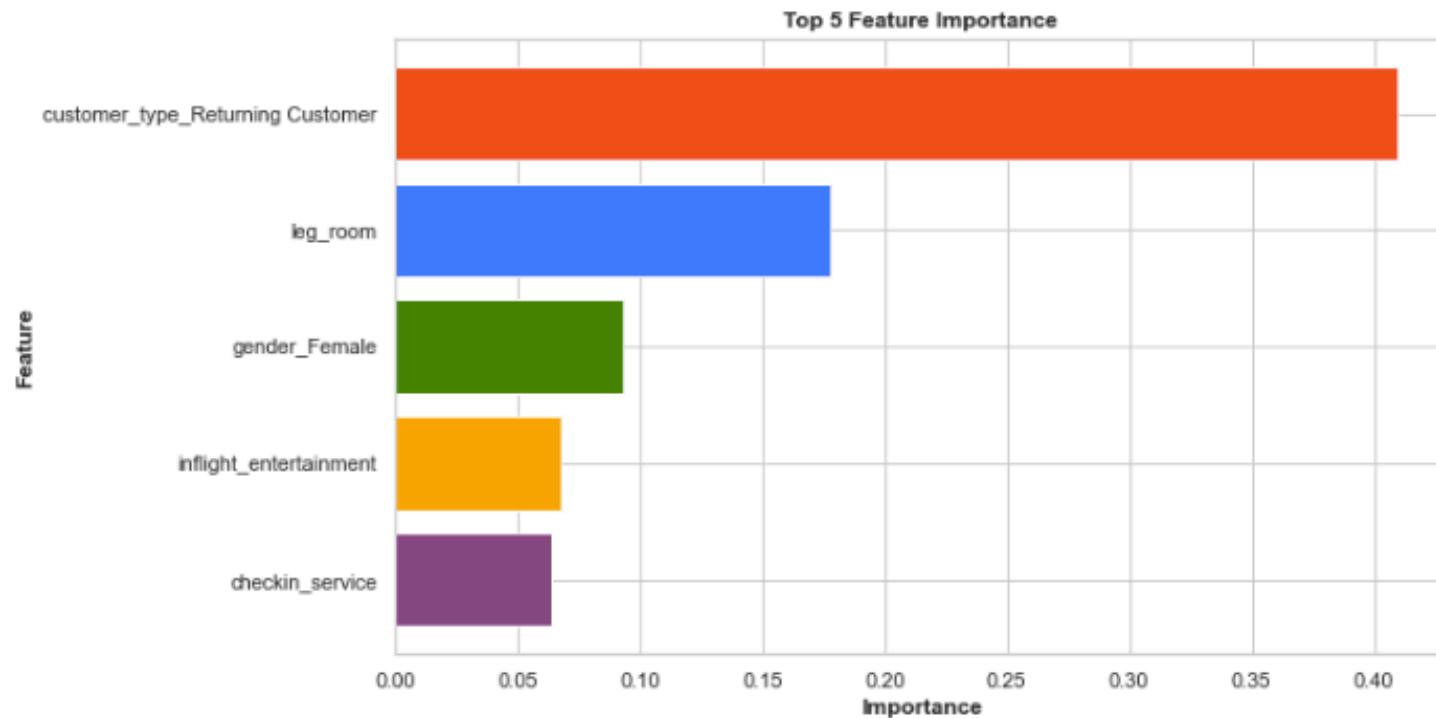
- Best Model: XGBoost Classifier
 - 96% F1-Score – Neutral or Dissatisfied
 - 97% F1-Score – Satisfied
 - AUC = 96%
- Evaluation Metric:
 - F1-Score is the harmonic mean of recall and precision.
 - AUC tells how well the model performs.
- Important Features:
 - Customer type: Returning customer
 - Leg room
 - Gender female
 - Inflight entertainment
 - Check-in service



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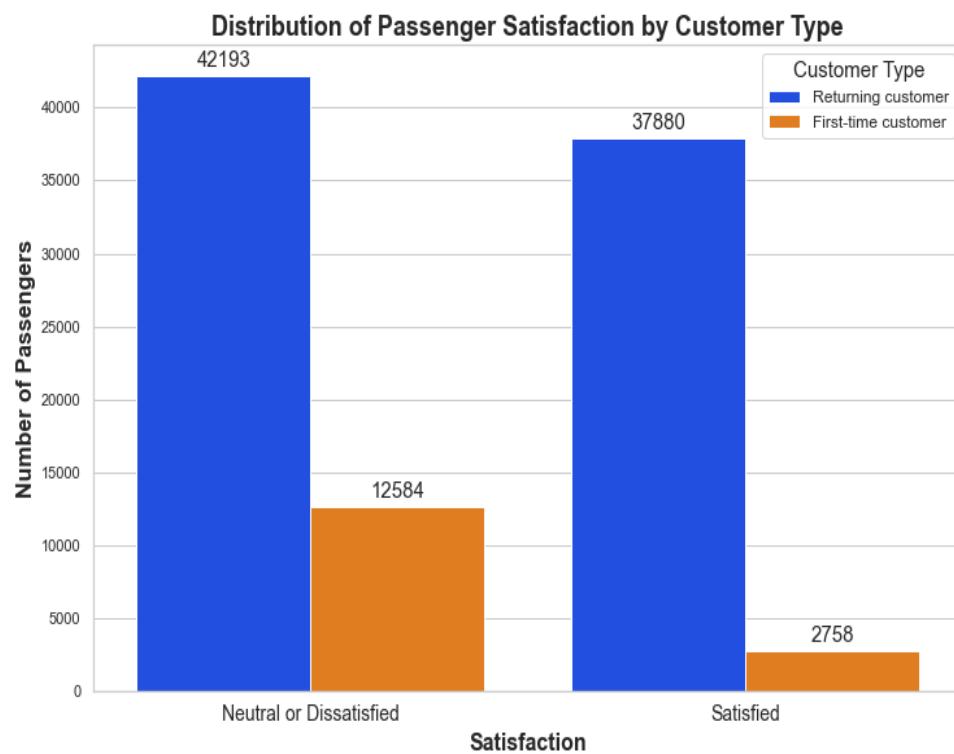
Important Features

- Top 5 Important Features:



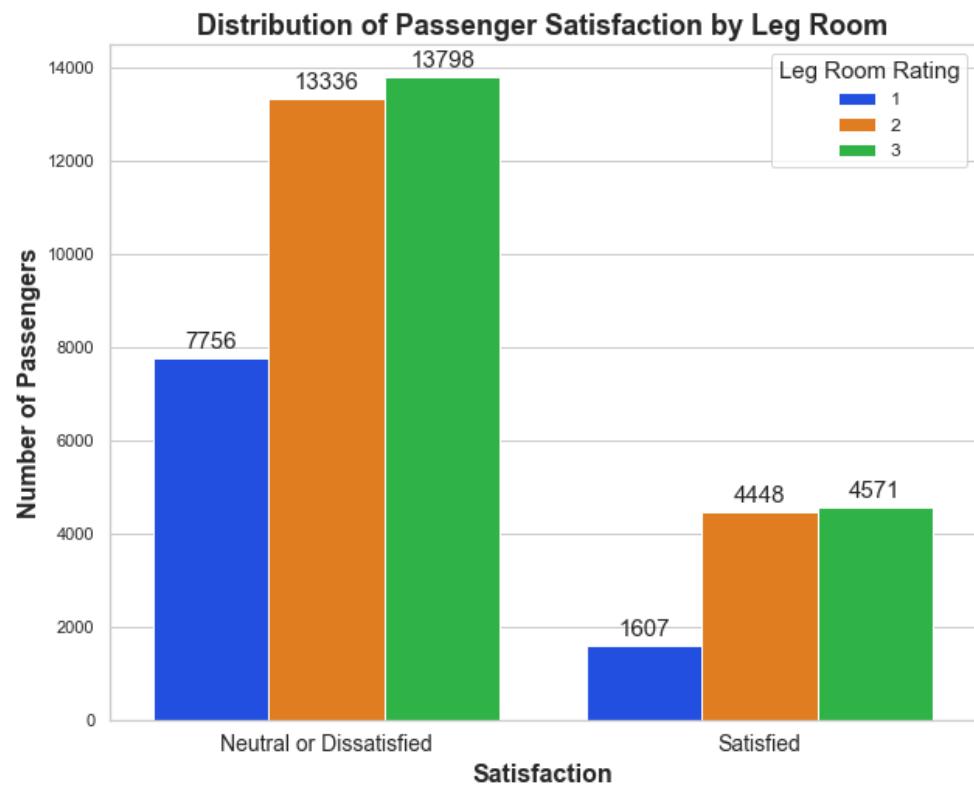
Returning Customers

- There were significantly more returning customers than first-time customers in the dataset.
- **Recommendations:**
 - Offer loyalty programs or rewards to returning customers.
 - Offer special perks or benefits to returning customers.
 - Priority boarding.
 - Free baggage check.
 - Provide personalized experiences to returning customers.
 - Offer special promotions based on their past behavior.



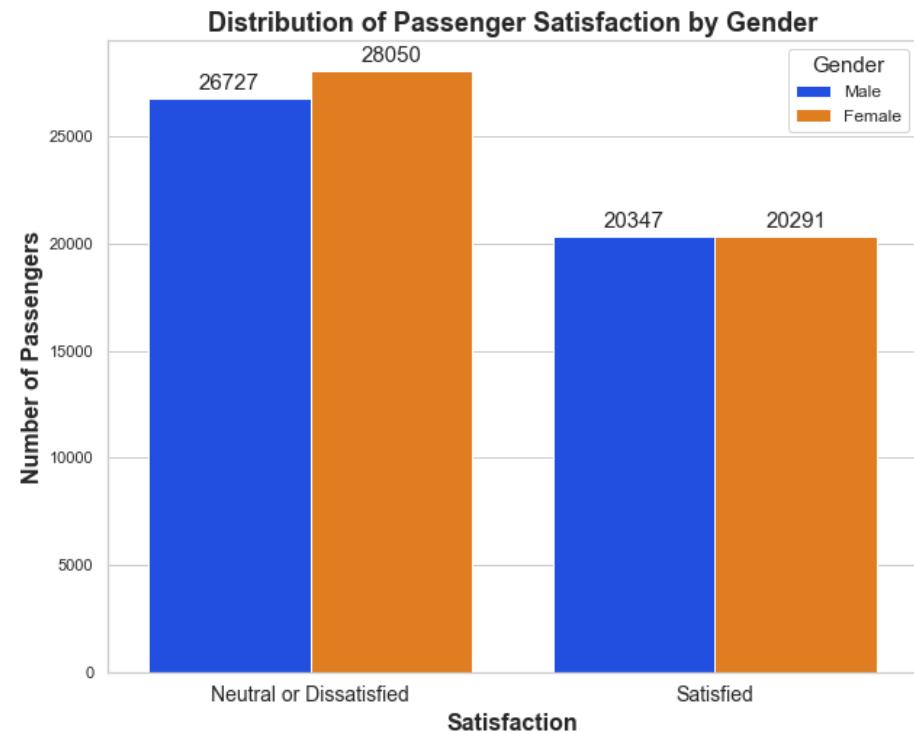
Leg Room

- Uncomfortable seats mean unhappy passengers.
- Recommendations:
 - Increase leg room
 - Comfortable experience
 - Customer loyalty
 - Repeat business



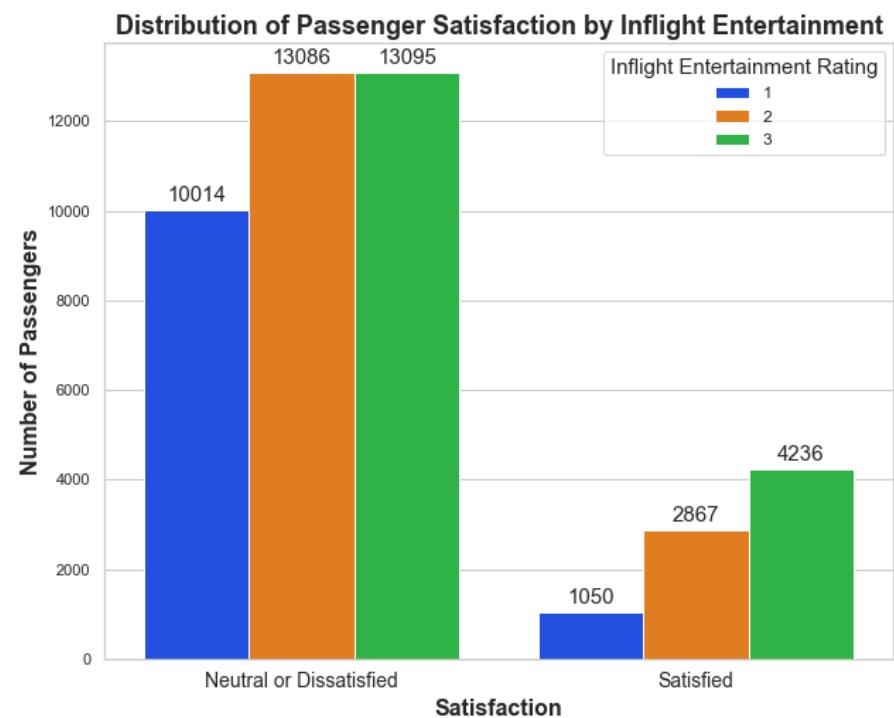
Gender Female

- The female gender is more impactful than the male gender for this model.
- There are more females than males in this dataset.
- **Recommendations:**
 - Ensure that their services are inclusive and welcoming to all genders.
 - Any biases in data collection need to be addressed.
 - Investigate whether there are any specific areas where female passengers have unique concerns or needs.



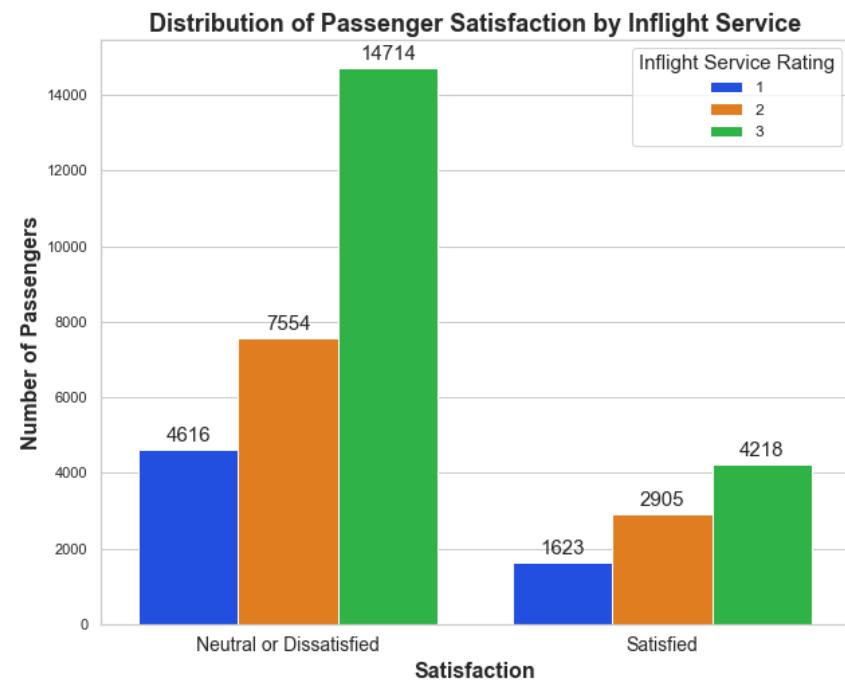
Inflight Entertainment

- Poor inflight entertainment will cause passengers to leave neutral or dissatisfied.
- **Recommendations:**
 - Charging ports for every seat.
 - Multilingual content.
 - International passengers
 - Updating the selection of movies and tv shows frequently.
 - Have the UX team explore innovative approaches to keep the entertainment app user-friendly.
 - Personalized experience.
 - Allow passengers to save their preferences.



Check-in Service

- Passengers that are unhappy and frustrated with the check-in service are likely to be dissatisfied.
- **Recommendations:**
 - Work with the UX team to ensure the online check-in service is as user friendly as possible.
 - Improve staff training.
 - Ensure that staff are capable of handling all situations to help expedite the check-in process.
 - Staff accordingly.
 - Ensure there is enough staff to assist passengers during the busy travel hours and days.
 - Provide an ample amount of self-service kiosks at the airport for customers to check-in and print boarding passes.



Future Work

- After adjustments have been made from the recommendations provided, perform another analysis to see if customer satisfaction has improved.
- Try different models with different tuning techniques to see if they perform better.
- Collect additional data: The dataset used in this analysis only includes a single airline. Collecting data from multiple airlines may provide more insights and make the results more generalizable.

Thank you

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🔗 <https://github.com/MHolthouser1024/Airline-Passenger-Satisfaction.git>